CHANGING PERCEPTIONS IN THE WORLD OF MACRO-MOTHS AND MOTH-PERSONS DURING THE PAST FIFTY YEARS

GERRY HAGGETT

Meadows End, Northacre, Caston, Norfolk NR17 1DG

Our President, on informing me of Council's decision to invite me to honorary membership, suggested that I might share my thoughts on moths and mothing over the past half century. The timing is especially appropriate as we reach the end of the twentieth century, with such profound change having taken place, both in our wildlife interest and in the nation that should protect it. I have accordingly attempted to mention the most noteworthy happenings of this period in the broader context of the community, while remaining conscious that to do justice to all would occupy more than the pages of one part of this journal. As readers will see, the opinions expressed are most definitely those of the writer!

EARLY DAYS

It was my good fortune to live, as a boy and young man, under the tutelage of that giant of the Noctuidae A. J. Wightman, and I preface this narrative with reference to him, not simply to pay tribute to the profound knowledge gained by individuals then, but more to focus on the method in which that wisdom was gained first-hand from a long life of field observation, and as witness also to the end of an era epitomized by him that had begun in the late Victorian and Edwardian times of Barrett, Tutt and South, and whose pattern was then set for the next half century. Knowledge of the British moths was still rooted in painstaking search-and-collect by hand, in diligent beating, sweeping, sugaring and the rearing through of unidentified larvae to moths.

Moths there were a-plenty, but they had to be worked hard for, and collections were built slowly, specimens being assiduously added, often over many seasons, with the aim of assembling the conventional row or series with local forms. The less common were added singly rather than as a one-off completed set from one night's collecting or bred from one female. Collection was the unambiguous goal, for it was a long while before 'study' euphemistically replaced that robust but lately much misrepresented term. Knowledge of habits and behaviour of individual species through their stages of development were acquired first-hand, as were localities, and although there had always been exchange of information as well as of specimens and livestock, the spread was mostly between close colleagues and long-established circles. The average macro collection of those times began strongly with the butterflies and went through the hawks and larger moths to the acronyctas and more easily identifiable noctuids. But they thinned out at the internal feeders, peaking again at the plusias, sharks and crimsons only to trail off into the geometers for the larger showy species. Lots of bred magpies *and* orange moths would be there with a good showing of thorns and beauties. Cossoids and burnets were in, but clearwings less well thought of.

During the period following the Second World War Britain enjoyed stable, warm temperatures the like of which we have not seen since. Night work could be counted upon in the southern counties throughout the year. Moths at sallow blossom were so embarrassing in number that they followed the lantern from bush to bush as a wondrous cloud, while ivy flowers were so productive that an evening's round could afford to neglect all but the richest and easiest sites to work. A light trap was for

most of us available only from the household plug, and Gordon Smith achieved fame with his giant mobile generator that, for the first time, revealed *alni* to be no rarity.

Collections and collectors

Journals continued to feature each year's collecting by luminaries such as the legendary Baron de Worms who seemed annually to work the same localities in the same sequence. Favoured haunts were fewer but heavily worked, with Dungeness, South Devon coastline, Norfolk Broads, Wicken and then Woodwalton Fen, the Breck, Sychnant Pass, New Forest, the Lakes, Rannoch and increasingly Aviemore, the more regular. The war-years had inhibited gatherings but the Annual Exhibition of this Society soon returned to confirm its pre-eminent position as the lepidopterist's major event of the year in the prestigious rooms of the Royal Society at Burlington House. It became jam-packed with overflowing tables of exhibits and set a pattern of convivial conversazione that has endured through changes of venue.

It was the hey-day of Edelsten and Demuth, but dominated by Cockayne and Kettlewell, with Goodson managing their joint collections at Tring (through a haze of cigarette smoke), that were later to be incorporated into the National Collection at Cromwell Road under the name of the R-C-K coll. Austin Richardson was the supreme collector with the famed but dubious distinction of arriving late whilst making off early with the cream of that night's take. Auction sales that had once generated such drama were in terminal decline and the price of a Gurney cabinet remained a distant hope for the average collector. Buckler went for £14 a set and the new books were yet to be written.

Understanding of the distribution and habitat requirements of our moths then was a combination of collecting notes in the journals, product of word-of-mouth plus the time-honoured localities of the last century. Fewer species were then so localized as they have since become, and the scarcer ones were kept as a close secret. The broader picture given in standard works still summarized the lists of the Victoria County Histories. Identification was learned from updated editions and reprints of South's *Moths of the British Isles* or from the hands-on experience of colleagues, yet collecting remained so often a loner occupation with rarely more than two persons together. Lepidopterists were a thinly scattered breed and like artists were reckoned by the general public to be a little odd, and they were, with the most notable of rare exceptions, all male.

A new dawn in a bleak landscape

The nation's war-time demands upon land saw large-scale changes in its use, with the beginnings of modern agricultural techniques but still without herbicides, with scant fertilizers and with puny tractors. Great changes were begun in farm and forest that were to transform the countryside from what had long been known. The age of the motor-car had long since arrived, but without the roads it needed; so a collecting trip made from London to Torquay, to the Norfolk Broads or to Dungeness was still a tedious journey. Only the most venturesome renewed an interest in the Western Isles, and Ireland was regularly visited only by H. C. Huggins until the Burren Green signalled the neglected riches of that spartan treasure house.

This quaint world of the lepidopterist was shaken by two major events: the impact of E. B. Ford's books on butterflies (1945) and on moths (1955), and the popularizing of mercury vapour discharge light traps by the Robinson brothers in

1950. Ford's books broke new ground in giving explanation to origin, variation, behaviour, habitat and distribution of British macro species which he related to the concepts of modern biology of that time. Here in two eminently readable books was a galaxy of stimuli to which the discerning collector or serious student could return time and time again for inspiration to shape his own field studies or genetic trials. The advent of MV as the dominant collecting tool made it possible for population monitoring and for this to be done in all manner of habitats constrained only by the weight of the portable generator. A revolution brought about by technical knowledge was now driven by the catalysts of a greatly improved road system, faster motor cars for all, smaller and more dependable generators, and above all a popular awakening of interest in the countryside and its wildlife in an age of increased leisure and prosperity.

Parallel with this new dawn ran accelerated awareness of the need to conserve our ancient and living heritage both by public bodies under political direction and by charitable trusts who were to combine as a national voice. Even in so short a while as the next five decades, the statutory bodies became politically emasculated and starved of resources, bringing about closer collaboration with private institutions but lacking the driving force of political will. During this time, land was acquired by these different bodies to be managed as nature reserves, some with complicated shared management, others with refreshingly direct control, but all dependent upon a system of grants and funding that has seen the share from public purse subjected to ever stringent manipulation, while the charities struggled to maintain their budgets and achieve their targets.

Yet at the same time that a growing wider public demanded conservation measures, those greatest users of land, in the form of agriculture and forestry, were subjected to the most relentless of economic pressure, which extended to extreme the use of monster drainage machines, the latest developments of the most potent of herbicide and insecticide usage, and the exploitation of land by the ultimate of mechanical invention. Destruction of marginal habitat escalated year by year, lowland and the flat-lands being the easiest and earliest susceptible targets. Yet this occurred also in the uplands where hill cultivation reached into new altitudes, where deep ploughing destroyed moorland and where even the deeper peatlands and limestone pavements became plundered by commercial assault. Deeply shaded conifers replaced native broad-leaved woodlands not only in state forests but in private lands under the lure of heavy subsidy. It is an unparalleled irony that as enlightenment beckoned, so such destruction should be unleashed, and an understanding of the political processes that financed it is an essential adjunct to any review of the fate and changed status of each of our resident moth species.

Records and recorders

Present-day knowledge of species distribution is much advanced due to countless records co-ordinated centrally from computerized returns of county organizers and based on the initial data entered by an army of volunteers. These folk have boomed to cover, in some measure, the length and breadth of Britain and, in the main, they follow the stimulus of their local natural history society or County Museum which may service their activities and certainly provide major computer facilities, although pressure upon Local Government finances may bring about charges for them. Records come primarily from enthusiasts gathered at regular outings when identification can be made in the glare of the MV lamp with expert verification at hand, or made in the seclusion of the garden or local patch when errors only become

apparent at the annual group slide show. Lists are made up and species names (mostly in the vernacular) entered, even ticked, against the minute print of the abbreviated name record cards sometimes edited locally to accommodate all those species known or expected from the county, the aggregate being sorted and hopefully verified by the group or county recorder. Other records, of course, continue to be contributed from more traditional sources, but members of that modern phenomenon, the moth group, supply the bulk. This mammoth bank of data has attracted discussion over who owns it, who can make use of it and for what purposes, and who should bear what charges and costs for publications based upon it. By 1991 the Rothamsted network of tungsten light traps operated on 95 sites in Britain, and had celebrated over twenty-five years of trapping. It had generated an abundance of data, especially phenologically rich; similar information has accrued on computers of the counties, intended for eventual use in the writing of county Histories, but available also for future national analysis. The Rothamsted data can be linked to similar bases gathered by organizations across Greater Europe into Western Russia, who have been monitoring moth populations, mostly since 1993 but even as far back as 1960 for Hungary.

Out of such a wealth of data, past but mostly present, have evolved the national status codings that indicate a range of scarcity or abundance and thus the conservation perception for each species. These check out well enough for insects confined to limited habitat but are less meaningful when distinctions are attempted between the larger numbers of species perhaps better classed collectively as local; and they do not reflect the cyclic pattern of population change that most experience, sometimes at long intervals, and which can be a characteristic of lower profile species. Nor does a system based primarily on moths seen at light cater adequately for those weaker-flying and less easily identified, like the pugs, and whose distribution is better revealed by larval evidence. Updating is, of course, possible but brings in its turn the question of assessment that is meaningful in separating species in on-going decline from those of cyclic fluctuation.

Changes in moth fauna

Mercury vapour light has seen a fair exchange between species formerly regarded as rarities but now recognized to be more numerous, and those once thought to be of general and regular occurrence but now much less often encountered, and as this latter category does contain a disproportionate number of geometers it might be thought that the change in concept has more to do with collecting techniques than real change. Of one group there can be no doubt, those colonists that either were formerly regarded as intermittent migrants before becoming established—usually along the South Coast counties—or those that made settlements soon after their initial discovery and quickly moved to become resident across much of lowland Britain. Whereas such additions to the resident fauna had been understood from earlier times there is no doubt that the numbers following this pattern have markedly increased more recently and we can but conjecture whether this be due to the expanded army of recorders or to shifts of climate—or to both? The colonization by alien moths of exotic conifers introduced to Britain on a significant scale only in post-war years is a phenomenon all too clearly evident, while glasshouse production of both food and flowers has attracted further species that can be of commercial interest. Distribution of "garden" species from the proliferation of garden centres has been the presumed source of relocation of resident juniper and *Berberis* feeders into urban environments, whilst increasing

beyond imagination the variety of host-plant cultivars for them. So, too, in the maturing coniferous forests where not only the pine and fir feeders have greatly increased their numbers and territory but where novel host-plants introduced on a grand scale have offered scope to larvae previously known as broad-leaved or heather feeders. The two moths that became occasional large-scale forest pests were both on alien pine species, and *Panolis flammea* could well have jeopardized afforestation of *Pinus contorta* on northern peats but for man's artificial control by aerial insecticide application, use of virus and pheromone bait.

There are around 50 species that have been added to the total British list of macros during the past fifty years. Thirty of these can be regarded as migrants, vagrants or outright stowaways and of the rest, seven have colonized the greater part of southern Britain, with the remainder being reckoned to be resident species never previously recorded, and it is questionable how many of these, too, could have originated as colonists. Of the total species added in this period, only the sibling species together with those of remote locations can surely be regarded as long-standing residents. One of the most revealing facts resulting from wide use of MV light has been the heightened awareness of movement of moths into new territory, and that the habit of the majority is to range well outside their chosen habitat, producing abundant and regular movement into these islands from abroad with subsequent residence of some species. A consequence is that we think that more of our species, regarded at one time to be long-standing residents but here no longer, have followed the pattern of temporary colonization of *Trigonophora flammea*, *Minucia lunaris* and *Arctornis l-nigrum* amongst others, and that more residents depend upon regular reinforcement than we had supposed hitherto.

We have witnessed also dramatic increase in species long resident, such as the since dwindled expansion of *Rhyacia simulans* to the south and eastern counties, in contrast to the renaissance of *Perizoma sagittata* not only in its traditional fenlands but also from the Norfolk broads to the midland shires, while the steady spread of less robust species like *Parascotia fuliginaria*, *Idaea vulpinaria* and *Elaphria venustula* appears to be genuine territorial advance. Regular trapping on the same site can, however, also reveal how the commonest of species can have lean years when population levels crash and then recover, and we can find this to be not just a local happening but to be of widespread occurrence.

The general run of British moths seem to have withstood the commercial onslaught into their habitats rather better than have our butterflies, but total losses are still too numerous and comprise our most demanding species. Since 1945 we have suffered the loss of seven species plus the subspecies *bondii* of *Photedes morrisii*, most of which can be attributed to deterioration into unsustainably small populations as a result of fragmentation and decline of their specific habitat even though their chosen biotope may survive. In southern Britain too many species have suffered population dislocation and constriction with the inevitable problems for gene diversity and viability. Of the upland and alpine moths we believe there have been fewer pressures but we have yet to measure the damage wrought at lower altitudes by afforestation schemes. Only seven species of moths are protected by law under the Wildlife and Countryside Act 1981 (revised 1995), but two are already extinct, and one is perilously close to extinction; while the remainder are in isolated and restricted colonies of low numbers. Young (1996) observes that these seven moths make an interesting contrast with no less than 25 of the 57 resident butterflies that are scheduled under the Act, if only to prevent commercial dealing. Regular revision of the Act provisions sees the occasional moth added, and in the light of continued habitat destruction we may wonder who exactly is targeted.

The new professionals

Awareness of wildlife problems attracted students looking to qualify in natural science and some to examine the problems of Lepidoptera in particular. The years under review saw not a few progress from first degree to environmental studies that could focus on the predicament of individual species. At one time the then designated Nature Conservancy was the natural home for successful postgraduates and we experienced a rash of PhD students eager to advance projects for the protection or reintroduction of butterflies, but moths were at first less successful in attracting this talent and such is the perversity of life that just as that prospect beckoned so government funding waned. The careers of newly qualified scientists (and of others already longer into their jobs) were, in consequence, directed to commerce or education and only the most hardy and resolutely motivated remained to take up the wildlife challenge. The newly hatched British Butterfly Conservation Society soon found nectar and attracted professionals, then promptly moulted and in its new skin began to take moths into its care. The professional was certainly back in business but with a totally changed status from that of the Victorian collector, and as museum jobs shrank alternative careers were pioneered in the broader field of conservation and the better financed national societies, but where scope was possible also for a parallel interest in moths. The process begun by Ford was extended by these new scientists to embrace all manner of behavioural responses and physiological mysteries with inevitable use of the doubtful joys of statistics and thereby the eclectic analysis of matters hitherto the province of subjective discussion. Its practical usage could, however, fail in the separation of species for while a precision could be placed on the likelihood of correct determination this was of little value to the biologist who wanted to be sure! However, help may be forthcoming in the use of group or discriminant analysis as long as the fastidious and scrupulously accurate measurement data can first be gathered.

Bottoms up!

A natural sequence to the matter of species distinction is the emergence during the past fifty years of genitalia to be the supreme arbiter of species recognition, the studies of Pierce being elevated to the status of cult. During this period the numbers of species whose separate existence is dependent solely upon differences in their genitalia have multiplied. Unfortunately, some of them have proved too difficult to rear in numbers from parents so determined, so we are unable to verify—as is possible in those species where their genitalic differences corroborate other characters—that such species are indeed exclusively independent breeding entities. While the recognition of species barely advanced along the long road of speciation may be of significance to other branches of biology, it is of lesser importance to the field lepidopterist; indeed it can be frankly confusing in encouraging records to be submitted of specimens whose identity is too frequently only guessed at from wing characters. As the genitalia species have thrived, those siblings that lack distinctive apparatus, such as *Eupithecia goosensiata*, *Diarsia florida*, *Mythimna favicolor* and *Aporophyla lunebergensis*, continue to remain in limbo, yet the insects called *Plusia gammina (gamma)* and *Phlogophora lamii (meticulosa)* were consigned outright to the systematist's dustbin, because they failed to possess the slightest of unusual bumps in the right places.

Life histories

Much more is known today of life-histories and in particular of the larvae of our moths and we hear more of the difficult species—not necessarily scarce or local ones—being reared successfully. This, however, is all too often due to the easy availability of females at light traps than to the study of larvae in their environment, which is the more instructive option. Identification of wild larvae has remained poorly served by the inadequacy of illustrated books; Buckler's now expensive and scarcely obtainable volumes still remain the only seriously helpful work. The imminent publication illustrating larvae of the entire British macro species should inspire interest and re-kindle study of this most definitive and compelling branch of science. For there is much work to be done in unravelling the precise requirements of each stage of so many of our moths, as has been done with spectacular success in our butterflies, and amongst those most in need are the internal feeders and soil dwellers that comprise so many Red Data Book species and whose stratagems remain to be discovered if their conservation is to be enhanced. The exact host-plant is also still unknown for too many other species. We desperately need a key to the identification of larvae based on their morphology, for I am not aware of research in Britain to match, for example, the comparative morphological studies being pursued by key workers in mainland Europe and Finland, and who are as a result far better placed than we to judge larval structure as a contributor to moth systematics and conservation. As long as larvae remain no more than incidental to the provision of cabinet specimens and county lists then we shall remain impoverished lepidopterists.

Systematics and nomenclature

Systematics and nomenclature have seen enormous progress and enlightenment in the last fifty years and while inevitably closely dependent upon the work of experts of national museums, there has been more participation from knowledgable laymen. A look back to Heslop's Checklists of the 1940s reveals archaic grouping and the relict survival of the "Bombyces" which primitive concept was firmly replaced by the realism of Bradley and Fletcher in Kloet and Hincks' Checklist of the Royal Entomological Society Handbooks and updated in their subsequent popular versions. Here, amongst many long overdue improvements, the arctiids were admitted into the Noctuoidea, and the drepanids and thyatirids into Geometroidea. We now have only to ponder on the fates of the likes of *Diloba caeruleocephala* and *Colocasia coryli*. Arising from this framework have come sophisticated further lists involving substantial revision of the Noctuidae by Fibiger and Hatcher (1991–92) amongst others and recently further advanced by Beck (1996). The reasoning behind earlier revisions was not well publicized in popular journals and I can only recall the work of Tams (1939) who published his proposed generic changes in the Noctuidae with explanation by taxa. So whereas amateurs, collectors and field workers scrambled in the past to digest each revision which they regarded as academic to their interests, now there is discussion and even accountability by some authors (e.g. Beck, 1996). However well argued and researched, these systematic lists remain uncertain in their treatment of problem genera such as *Perizoma*, *Theria* and *Alsophila*, of *Photedes* and *Parastichtis*, while individual species like *Photedes brevilinea*, *Rusina ferruginea*, *Mormo maura*, *Elaphria venustula*, *Perizoma taeniatum* and *P. sagittata* all call for re-examination of their still unhappy associations.

So it is, and always has been, in the perhaps more relevant field of nomenclature, to the extent that today in his casual field conversation the collector may be

conversant not simply with the 'current' species name, or with its recent alternative, but in the case of moths like *Diarsia mendica*, *Polia bombycina* and *Rusina ferruginea* with its South equivalent as well. And those unfortunate pairs the spectacles and the silver-lines looked doomed to be revised and reversed for ever and most of us must have recourse to their English names in order to be sure of which we speak. Simple comparison of the names of noctuid and geometer moths in the list of Heslop (1947) with that of Emmet (1991) indicates that changes were made in the intervening years to around 15% of generic names involving twice that proportion of total species, to 8% of specific names and to 2% of both the generic and species names of individual moths. The total changes involved 293 species out of Heslop's 670 (noctuids and geometers) or 44%. We might have expected changes in specific names to reduce as the bank of alternatives was worked over, but to have expected also—indeed feared—that the creation of new genera was likely to continue as more evidence accrued, until sadly monotypia threatened each species. For many of us Kloet & Hincks (1972) remains the indispensable means of relating species of past literature to present-day nomenclature.

Moth books

Revolutionary techniques in printing have brought about the instant book with better quality illustration of both living and set moths and especially of their early stages. Some beautiful colour-works have appeared, most notably printed on the Continent of Europe but also in the Far East, and sadly one of the most ambitious of British works failed to match this standard in its earlier volumes. The void left by South's very out-of-date revisions was filled by Skinner & Wilson (1984) so successfully that their book has proved to be matchless for twitchers and beginners and no moth group member is without it. Nevertheless it remains a commercial fact of life that the more scientifically based a book, the smaller its market whereas the coffee-table book or browsy pot-boiler will better attract the profit-driven publisher and its smaller price the wider public. So we have seen diversity and ingenuity in providing for the undiscerning reader while specialists have had to be more patient. Even official works are known to have been tardy in receiving sanction for publication and then for only limited part of their potential. However, local lists have proliferated, and while their standard has reached art-form for butterflies, our moths have been less well served. Local contribution comes increasingly from regional and county groups, some long-established, others very new, all exploiting the modern facility of desk-top publishing to add to the national pile of data. Of the lepidopterous journals we noted with foreboding the collapse of the once prestigious *Entomologist*, now restored as the up-market in-house journal of the Royal Entomological Society whose more popular sister production is a good indicator of the way times have moved. But from humble origins of facsimile typescript the *Entomologist's Gazette* has blossomed to cater for the longer paper and it, too, is heavy with professional input. The profile of moths was greatly raised also in publications of wider public wildlife appeal and from time to time even in the national press. Economics and limited subscriber numbers have seen off the monthly issue but, by contrast and reflecting the life of the modern nation, there is a recently launched biannual devoted to the most sensational and rarest records of each year.

The community of lepidopterists

As in all walks of life the mothing community is now much broader based, well populated with knowledgeable individuals, the attendance at moth nights runs across the ages, and while most youngsters may be taken home by midnight not a few remain into the early hours. Workshops attract the same cross-section of society with ever new faces and swollen numbers, their exceedingly well-equipped photographers keen to contribute colour transparencies and prints to an astonishingly high standard. Species are for the main part instantly identified with surprising accuracy, at least of many genera, yet the absence of voucher specimen or photo can still prove embarrassing. Migrants are detected soon after arrival, indeed lights are massed for them at the best-known reception coasts after appraisal of meteorological forecasts, their likely sources and routes later reconstructed from sophisticated weather analysis, and species new to Britain (once the ultimate experience of the collector) are of regular, if not multiple, annual occurrence at light traps permanently run at Dungeness. There is even a moth-line to satisfy the unabashed twitcher. Identification of the less familiar is aided by the ready availabilty of exotic stock so the scarcest of British species along with vagrant and accidentals become known (and preserved) from livestock either from Continental exchange or from the results of British collecting abroad, or from the exhaustive lists offered from all manner of origin. Group field meetings are the norm in all but the regions of sparse human population, planned to locate individual species, to register their current local county status, to fill a gap in the local recording scheme or complete a 10 km square. Group work may concentrate numbers of lights for these and other purposes and their massed fire-power has revealed species long searched for unsuccessfully by individuals. And the field meetings of this Society continue to play a prominent role. Even the lone operator will reckon to set up two or more lamps and all manner of ingenious apparatus has been developed to allow all-night running of thirsty generators, but with the added modern problem of potential theft or vandalism. Well-known collectors may regularly operate as many as six lamps of one pattern, others a judicious mix of MV and the more mobile actinic traps whose pocket-sized batteries also permit a full night's collecting. Lights are run the year-round by those with interest in species tolerance of seasons and weather, others in series to compare species incidence. As a result of so much information we have come to question long-held concepts of emergence-times and brood-pattern (voltinism is the buzzword) and find some species likely to be present throughout a season, just as larvae may occur through the winter in a variety of instars. We are familiar with erratic species attendance at identical lamps operated within but short distances and sharing common habitat; we ponder whether these observations are real or only apparent and learn anew the resource, resilience and variety of the insect world. And our understanding of species distribution has been utterly revised as more records come from outside known ranges even of species thought to be the most sedentary.

Today the number of people who take significant interest in our moths greatly outnumber collectors, and while no sharp boundary can be drawn between them, those who simply watch do constitute a potentially larger voice than the shrinking number who wish to build a comprehensive collection. Actual numbers of specimens retained for individual collections are probably fewer than at any time in the past century for there are social, economic and financial constraints in additional to the ethical and conservational. On the other hand there are not a few folk who, while loudly opposed even to the temporary imprisonment of a specimen in the early days of their interest, now accept the need for refrigeration pending identification and the

desirability of rearing from wild females. Discussion on the ethics of collecting features in the activities of all responsible societies and journals and codes of conduct have been designed. This much discussed and well-rehearsed debate has been broadened by the easier availability of so many species that collecting simply to obtain them is for most folk no longer a challenge but instead offers the means to assist their understanding. This Society shares the even stance on restraint on collecting while continuing to support its need in the widest cause of conservation and taxonomy.

There is but little doubt that commercial exploitation of land will continue indefinitely and protest by country lovers and conservationists will remain marginal against the smoke-screen of political posturing. On the other hand land continues to be acquired by public and private bodies for the express purpose of wildlife and landscape protection and for public leisure and quiet enjoyment. It is the greater countryside that must inevitably become ever-rationalized at least in most of lowland Britain, driven by an insatiable and ever-demanding consumer society and dictated by obsession with industrial economic success. Yet a majority of our resident moths look well able to adjust their tolerance requirements to allow exploration and occupation of re-created habitats be they ever so unattractive in comparison with former haunts. While we shall continue to experience individual species losses both of range and territory as well in some cases of the species themselves, we shall see also the numbers of colonizers grow and residents derive even from adventists. The figures I have given of seven extinctions to fifty species added to the British list of macro-moths in the past fifty years is not too far removed from Gardiner's 1997 ratio of one extinction to ten new species for all British Lepidoptera from all causes in the same period. The new army of watchers in all its variety is ready to monitor these changes and to witness the shifting balance of the British fauna in both time-scale and magnitude as has never before been possible.

References

Beck, H. 1996. Systematische Liste der Noctuidae Europas (Lep. Noct.) Neue Entomologische Nachrichten, 36.

Buckler, W. 1881–1899. *Larvae of the British butterflies and moths.* Ray Society, London.

Emmet, M. 1991. In: *Moths and butterflies of Great Britain and Ireland* **7**, Pt 2, Harley Books, Colchester.

Fibiger, M. & Hatcher, H. 1991–1992. *Systematic list of the Noctuidae of Europe.* Esperiana.

Finnish Environment Institute 1996. Moth Monitoring Scheme, Helsinki.

Ford, E. B. 1945. *Butterflies.* New Naturalist, Collins, London.

Ford, E. B. 1955. *Moths.* New Naturalist, Collins, London.

Gardiner, B. O. C. 1997. Extinction and acquisition. *Entomologist* **116**, 69.

Heslop, I. R. P. 1947. *Indexed check-list of the British Lepidoptera.* Watkins & Doncaster, London.

Kloet, G. S. & Hincks, W. D. 1972. *A check-list of British insects Part 2, Lepidoptera. Handbooks for the Identification of British Insects.* Royal Entomological Society, London.

Skinner, B. S. & Wilson, D. 1984. *Coloured guide to the moths of the British Isles.* Viking, Harmondsworth.

South, R. 1939 & 1961. *Moths of the British Isles.* Warne & Co., London.

Tams, W. H. T. 1939. Further notes on the generic names of British moths. *Entomologist* **72**: 133–141.

Young, M. 1996. *The natural history of moths.* Poyser Natural History, London.